

Solid Waste Industry for Climate Solutions

***Allied Waste Services
County Sanitation Districts of Los Angeles County
National Solid Waste Management Association
Norcal Waste Systems
OC Waste & Recycling
Republic Services
Riverside County Waste Management Department
Waste Connections
Waste Management***

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To CARB via on-line submittal at:

http://www.arb.ca.gov/lispub/comm2/bcsubform.php?listname=sp-recyc-waste-ws&comm_period=1

Subject: Climate Change Scoping Plan – June 2008 Discussion Draft

Dear California Air Resources Board:

The Solid Waste Industry for Climate Solutions (SWICS) is an informal coalition of both public and private solid waste and recycling service providers. Our goal is to ensure that climate change policy makers are provided with the most accurate and comprehensive information regarding our industry and our operations that may generate or reduce greenhouse gas emissions. On behalf of SWICS, we are pleased to take this opportunity to comment on the Climate Change Scoping Plan – June 2008 Discussion Draft. We understand that CARB will be accepting additional comments on the Appendices to the Draft Scoping Plan until August 11, 2008. SWICS may make additional comments on these appendices, but requests additional time until August 18, 2008 due to their belated release.

SWICS members do not object to reasonable and responsible reporting of greenhouse gas (GHG) emissions. Our following comments discuss the significant issues surrounding solid waste management that must be resolved prior to inclusion of this sector in a regulatory framework for the control and reduction of greenhouse gas emissions. These issues include:

- 1) A preoccupation with landfill emissions to the exclusion of negative and positive GHG impacts of other solid waste management activities;

- 2) A failure to incorporate a life-cycle assessment of the GHG impacts of solid waste management and recycling services;
- 3) Little recognition that solid waste management and recycling are essential public services, and that associated GHG emissions are already very low and have decreased steadily over the past 30 years.
- 4) No inclusion of carbon mass balance and life cycle impacts in the solid waste operations reporting protocol;
- 5) No inclusion of carbon storage in the estimation of GHG emissions from individual landfills and no recognition of the GHG impacts from changes in stored carbon associated with other solid waste and recycling activities (e.g., paper recycling, composting); and
- 6) Little differentiation between biogenic and anthropogenic CO₂ emissions in proposed reporting, accounting and regulatory programs.

Draft Scoping Plan Focuses on Landfill Emissions

SWICS is pleased that the projected GHG reductions to be achieved by the Solid Waste and Recycling Sector under the draft plan have been reduced to 1 MMTCO₂e from earlier estimates of as much as 2-4 MMTCO₂e. Nonetheless, SWICS believes these projections are too high as they are based on conservatively modeled landfill GHG emissions with high levels of uncertainty, that reflect neither the net reduction of GHG emissions from landfill carbon sequestration, nor the indirect reductions associated with beneficial use of landfill methane and recycling activities. When considering the total life-cycle analysis of solid waste and recycling services, SWICS believes that the total GHG emissions from our industry are neutral or even negative.

The Draft Scoping Plan focuses exclusively on landfills and assumes landfills are only able to capture 75% of the methane they generate in their gas collection systems. As SWICS has repeatedly pointed out, this assumption is based on a highly uncertain US Environmental Protection Agency (EPA) estimate of the average collection efficiency of landfill gas systems nationwide. Furthermore, this assumption does not reflect the more aggressive regulatory system that exists in California, nor does it reflect our drier climatic conditions, both of which affect landfill gas generation and collection efficiencies. As we have previously commented, most California landfills with gas collection systems operating in compliance with Air District requirements are capable of achieving 90%+ landfill gas collection efficiencies. The projected reductions in the Draft Plan associated with increased landfill regulation are based on a 75 % gas collection efficiency when a much higher efficiency likely already exists. Thus, the projected benefits of increased landfill regulation are likely to be significantly overstated. *We recommend that if CARB wants to promote even deeper reductions than are already occurring, then CARB should allow methane destruction offsets to be generated at any landfill that can demonstrate greater than 75% collection and destruction.*

We support reporting of greenhouse gas emissions when a source is capable of providing accurate and specific accounting of its emissions and those emissions can be placed within the context of the operations as a whole. We are working to develop an accurate and transparent protocol that may be used in California and nationwide. The recently revised and updated SWICS landfill methane and sequestration protocols that are attached to this letter are the first attempt to do this. We believe the SWICS protocols improve and refine EPA and UN Intergovernmental Panel on Climate Change (IPCC) modeling, and should be considered by CARB as a first step to the development of better protocols for estimating GHG emissions from landfills. Once completed, CARB should consider the model developed by Bogner and Spokas from the landfill research supported by the California Energy Commission:

<http://www.energy.ca.gov/2007publications/CEC-999-2007-039/CEC-999-2007-039.PDF>

CARB has recently completed a comprehensive revised inventory of greenhouse gas emissions. The roughly 350 landfills in that state were found to emit approximately 5.62 MMTCO₂e of the total statewide emissions of 484.40 MMTCO₂e in 2004 – or about 1.16 percent of total statewide emissions. But, as noted above, these emission estimates are overstated due to the reliance on the assumption that California regulated landfill gas collections systems are only 75% efficient – and by ignoring the carbon storage benefits of landfills.

Using the SWICS protocol for estimating GHG emissions from California landfills, would result in total estimated landfill emission at less than 3.0 MMTCO₂e – or less than 1% of California emissions. But, even that would be an overstatement if the estimate failed to recognize landfills as carbon storage sinks that effectively reduce CO₂ emissions, as is done by both U.S. EPA and the IPCC. The recent CARB inventory of GHG emissions acknowledges that landfill carbon storage is equivalent to about 5 million tons of carbon per year. If converted to CO₂ equivalents this would be equivalent to approximately 19 MMTCO₂e – meaning that total landfill carbon storage vastly exceeds the emissions estimate of carbon released by either CARB or SWICS for California landfills. Focusing exclusively on the overstatement of GHG emissions from landfills is bad public policy, and not supportable by either good science or international GHG protocols.

The Scoping Plan lacks a comprehensive view of Solid Waste and Recycling Activities

SWICS believes that the GHG reduction benefits associated with recycling and renewable energy production are well known and understood. Life cycle assessments by U.S. EPA and its contractors, referenced in this comment letter, document the benefits of recycling and energy Recovery from waste. We urge CARB to recognize these sources of information and incorporate them into the Final Scoping plan.

In addition, Waste Management (WM) commissioned a report by ICF International that both documents the benefits of recycling – and explores the difficulty of assigning “credit” to any one party associated with recycling activities (Attached). However, the

difficulty in translating recycling benefits into tradable “offset credits,” should not limit CARB from promoting increased recycling in the Scoping Plan as an important tool for achieving GHG reductions.

Currently there is no widely accepted protocol that accurately accounts for greenhouse gas emissions from solid waste management operations on a site-specific basis. This includes fugitive emissions from landfills, emissions from compost facilities, emissions/sinks associated with recycling and materials recovery programs, and offsets from waste to energy operations. Development and acceptance of such reporting protocols is the first priority, and must be accomplished prior to inclusion of solid waste management and recycling activities into any reporting or regulatory framework.

SWICS supports the reasonable and responsible development of a unified GHG regulatory system for solid waste and recycling. While we are one of many voices calling for consistency in approaches to regulating GHG emissions and sinks in our industry, our plea for unification of programs and approaches has been less than successful to date. More than half the states in the United States and most Canadian provinces have contemplated some type of Climate Change initiative. Unfortunately, none of these initiatives are truly coordinated. In fact, every reporting platform we have seen developed or that is in development at present is different from every other in some important respect including the initiatives under the California Climate Action Registry (CCAR), The Climate Registry (TCR), the California Air Resource Board (CARB) the State of New Mexico, the State of Washington, the State of Oregon, and the U.S. Environmental Protection Agency (US/EPA) – just to name a few.

Currently, the CARB has mandatory reporting requirements that only require the reporting of GHG emissions from landfill flares, landfill gas to energy emissions, biomass conversion technologies, and waste-to-energy facilities – despite the fact that the vast majority of these emissions are biogenic in nature.

Recognition that solid waste management and recycling are essential public services and that GHG emissions are very low and have decreased steadily over the past 30 years.

With respect to decisions regarding solid waste management and its potential inclusion in any GHG regulatory framework, policy makers must be cognizant of the essential public service provided by the management, recycling and disposal of solid waste. Numerous policy and regulatory programs promote best practices in solid waste management. This has led to substantial reductions in greenhouse gas emissions over the past 30 years because of improved landfill design, increased recycling, waste-to-energy, and improved waste collection and transportation efficiencies.

In fact, if other sectors of our economy had reduced greenhouse gas emissions to the extent accomplished by the solid waste industry, America would have exceeded the requirements of the Kyoto Treaty. For example, Weitz et al. (attached) estimate that the actual level of greenhouse gas emissions produced by the solid waste management and recycling sector is about 25 percent of the levels emitted 30 years ago, and less than 20

percent of what would have been emitted if waste management practices had continued along the 1974 technology path.

Reductions are not achieved without cost, and the costs associated with solid waste management are directly passed on to the general public. Additionally, costs associated with GHG regulation impacting the solid waste and recycling sector will impact all cities and municipalities whose job it is to collect and dispose of waste. As such, we urge CARB to work closely with municipal governments and their service providers in fashioning a greenhouse gas program that reasonably and responsibly impacts the provision of these essential services.

The solid waste industry as a whole represents a small fraction, and in some cases a de minimis amount of greenhouse gas emissions. If GHG sinks associated with solid waste and recycling services are fully incorporated into a life-cycle assessment of our industry, we believe that net emissions will be substantially less than zero. Few other industries can make such an assertion.

The Complexity of Solid Waste Operations Must be Reflected in the proposed GHG Regulatory Framework Taking into Account Lifecycle Impacts

The regulation of GHG emissions from a single source (landfills) without taking into account the totality of the management system is counterproductive and could result in an increase rather than a decrease in emissions.

Reporting requirements must incorporate the complexities of all sources within a sector from a life cycle perspective. Failure to accurately quantify GHG emissions and sinks from all solid waste management technologies and operations will lead to an undue burden and an improper result. If reporting is left to a simplistic approach, CARB risks misstating the sector's true impact on climate change and losing the opportunity to identify real reduction strategies.

Recycling, effective long-term carbon storage practices, and reduced well-to-wheels transportation fuel carbon intensity should be recognized in emissions reporting and reduction strategies.

Attached to this letter is a pdf chart titled "Solid Waste and Recycling Life-Cycle." The chart is from US EPA's "Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment." As highlighted in the large green-dashed box, the solid waste and recycling industry encompasses far more than just landfills. The solid waste industry processes millions of tons of residential and commercial recyclables in our recycling facilities. The solid waste and recycling industry offers communities and businesses more effective and affordable recycling options as well as providing manufacturers and end users with the secure, consistent stream of high-quality raw materials they need to maintain operational efficiency -- taking the reduce-reuse-recycle concept into virtually every venue we serve. In residential areas, we are creating sustainable recycling programs through working partnerships with local communities and municipalities. As marketers of

post-consumer and post-industrial commodities, we are providing fiber, non-fiber, scrap metal, textiles, electronic scrap and plastics to end-users of recycled materials worldwide.

The significant impact of recycling and other greenhouse-gas saving activities such as waste-based energy, carbon storage are not recognized by the CARB Scoping Plan.

The development of a Scoping Plan that incorporates a more comprehensive view of solid waste and recycling activities will lead to greater insight and better policy decisions. We therefore propose that any GHG regulatory framework incorporate the following:

- Recyclable materials including estimates of greenhouse gas emissions avoided resulting from the diversion of recycled waste;
- Carbon sequestered by the landfills and other solid waste and recycling activities, expressed as CO₂ equivalents, and,
- Renewable energy or fuel generated by waste operations, either at the landfill, at biomass facilities, or at waste-to-energy facilities.

The Scoping Plan should not rely solely on unsubstantiated generalized estimates of fugitive emissions from landfills or emissions from our solid waste and recyclable material collection vehicles without consideration of the emission and reductions associated with the multitude of activities we conduct and services we provide. Rather than focus solely on landfills, SWICS strongly recommends that CARB develop a comprehensive approach to solid waste and recycling in the Scoping Plan.

For example, by following the procedures outlined in the U.S. EPA's "Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks" (<http://www.epa.gov/climatechange/wycd/waste/SWMGHGreport.html>), it is possible to show that most modern waste management practices result in virtually zero (or better) net greenhouse gas emissions. Thorneloe et al. have written a paper (attached) that describes how EPA's Decision Support Tool can be applied to communities to determine emissions. This paper shows that the solid waste management activities of a community of average size (population: 750,000) with 30 percent recycling and residual disposal to a landfill with landfill gas to energy has virtually a zero carbon footprint. That is, if all of the emissions sources and sinks are taken into account, the solid waste management and recycling activities of an average size community with these attributes are essentially carbon neutral. These attributes are very similar to that of the solid waste management and recycling systems in many states today.

We are aware that there may be a desire to focus on only a particular waste management method (e.g., landfills). However, closing the door to a comprehensive evaluation of the net carbon footprint of an entire industry is not appropriate. For example, composting is considered by some to be the most preferable method of handling organic wastes – despite that there are no understood or accepted protocols for estimating GHG emissions from composting and other organic waste management and recycling activities.

CARB must recognize and encourage the comprehensive assessment of all of the emission sources and sinks associated with the solid waste and recycling industry due to its particular complexity. If CARB fails to encourage assessment of all greenhouse gas emissions sources and sinks in its regulatory scheme, we never will find better ways to achieve the underlying goal of lessening the impact of greenhouse gas emissions entering our environment.

A number of our SWICS members have completed (or are completing) entity-wide reporting of GHG emissions to the California Climate Action Registry. For example one SWICS member, Waste Management (WM), has recently completed its 2006 inventory of greenhouse gas emissions from its California facilities. Many SWICS members are in the process of identifying the information sources, data collection methods and data systems required to conduct a company-wide greenhouse gas emissions inventory – with a goal to collect 2009 data for completing an inventory by 2010. The 2006 report of SWICS member’s California CO₂ emissions are available on-line at (and is summarized in the attached table):

<http://www.climateregistry.org/CARROT/public/reports.aspx>
(enter name of reporting entity)

In addition to reporting direct and indirect CO₂ emissions in California as required by CCAR, WM also provided voluntary supplemental reports including:

- WM processed recyclable material and associated GHG reductions based on US EPA’s WARM model
- SWICS-based estimates of landfill emissions and sinks
- Estimates of avoided fossil fuel emissions from renewable energy generation at landfills and biomass power plants

As an example and as summarized in the attached table, WM’s largest source of California greenhouse gas emissions is from its 4000-vehicle fleet in that state. WM’s landfills, using the SWICS protocols, are a distant second. WM’s other direct and indirect emissions are very small. However, the potential greenhouse gas reduction from the recyclable materials collected and processed in California and the amount of carbon sequestered in WM’s California landfills during 2006 greatly exceeded WM’s total emissions. The results of other reporting entities (e.g., Republic Services, etc.) are similar in nature and consistent with that of WM’s. *If consideration and recognition is given to the GHG reduction benefits of recyclable materials, energy recovery and landfill carbon sequestration, the solid waste industry’s operations could be considered a significant net carbon sink.*

Carbon sequestration should be reflected in the estimation of GHG emissions of individual landfill sites and other activities that store carbon

The U.S. Environmental Protection Agency recognizes that landfills act as greenhouse gas sinks in sequestering anthropogenic CO₂e. Similarly, in preparing the recent inventory of emissions, CARB has determined that annual carbon storage in California

landfills is equivalent to about 5 million tons of carbon per year. If converted to CO₂ equivalents this would be equivalent to approximately 19 MMTCO₂e – vastly exceeding the estimate by either CARB or SWICS for GHG emissions released by California landfills. This carbon stored in landfills would have been released as CO₂ to the atmosphere were it not for placement in an anaerobic landfill environment. We urge CARB to recognize carbon sequestration from a variety of sources, including landfills, forest and agricultural soils, and through composting.

A well-designed and operated landfill achieving 92 percent methane capture and oxidation could be considered virtually a “carbon neutral” landfill the basis of an overall life-cycle assessment over the lifetime of the landfill – from initial operations through the end of post-closure care. That is, with a 92 percent collection efficiency, the amount of lifetime fugitive landfill emissions would be roughly offset by the amount of lifetime landfill carbon storage. SWICS members are committed to ensuring that the landfills we operate achieve the maximum amount of methane collection and destruction (including maximum energy recovery) that is economically feasible. In many cases we believe we are already achieving overall 92 percent methane collection and destruction efficiency at many of our landfills in California.

CARB should recognize the important role of landfills in storing carbon and preventing CO₂ emissions that would have otherwise occurred. This carbon storage, or “sequestration,” is important because it removes carbon from the natural carbon cycle indefinitely, reducing net emissions of GHGs. The effect of this process on overall U.S. GHG emissions is very significant as it offsets more than 50 percent of landfill methane emissions (as estimated by US EPA), and exceeds, in absolute magnitude, the emissions from 47 of the 54 source categories in the US EPA’s nationwide GHG inventory.

Both the IPCC and US EPA recognize and account for carbon sequestration of undecomposed wood products, food scraps and yard trimmings disposed of in landfills for purposes of preparing national inventories. SWICS recommends that CARB, should it decide to apply reporting requirements to MSW landfills, to likewise incorporate carbon sequestration into the landfill GHG emissions calculation methodology it adopts for use. Just as methane oxidation in cover and methane collection and combustion are included in the estimation of landfill emissions, so too should carbon sequestration be an integral component of the landfill mass balance calculations. This will ensure completeness, transparency and consistency with the national inventory guidelines of both IPCC and the US EPA. It will also ensure a complete characterization of all human-related GHG emissions and sinks for landfills.

We have attached the following report to this letter prepared by ICF International (“*Landfill Gas Storage and Greenhouse Gas Inventories, ICF International, 2007*”) that further documents the reality of carbon storage or sequestration in landfills.

Accounting for Biogenic and Anthropogenic Emissions

Any GHG reporting and regulatory scheme must take into account the difference between biogenic and anthropogenic greenhouse gas emissions and sinks. Emissions produced

from biomass sources are distinctly different than anthropogenic fossil fuel sources of emissions and should be reported and counted accordingly. At the least, biogenic sources of emissions should be treated as carbon neutral and anthropogenic sinks of carbon should be encouraged. CARB's Draft Scoping Plan should clearly provide that emissions and sinks of CO₂ equivalents should be bifurcated into anthropogenic and biogenic CO₂ to understand the true impact of human activities on Climate Change.

The Western Climate Initiative (WCI) is currently in the process of proposing a GHG reporting and regulatory framework for its members – including California. While the reporting framework may require the reporting of biogenic emissions, it appears that WCI will not be subjecting biogenic emission to the proposed Cap and Trade Framework. CARB should follow suit and clearly articulate in the Scoping Plan that biogenic emission of GHG (principally CO₂) will not be subject to regulation or Cap and Trade.

Thank you for consideration of our comments. Many SWICS members are currently working towards defining their carbon footprints through the California Climate Action Registry or other reporting platforms. Calculating and reporting greenhouse gas emissions from the solid waste and recycling industry will be a time-consuming and complex process, but SWICS members are committed to establishing protocols that provide accurate and comprehensive accounting of our industry's activities. We are equally committed to working with CARB and its WCI partners to establish an accurate and meaningful GHG regulatory program.

We look forward to working with you.

Sincerely,

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Attachments:

1. WM Recycling Offset paper by ICF
2. Current MSW Industry Position and State-of-the-Practice on LFG Collection Efficiency, Methane Oxidation, and Carbon Sequestration in Landfills, Prepared For: Solid Waste Industry for Climate Solutions (SWICS)
3. The Impact of Municipal Solid Waste Management on Greenhouse Gas Emissions in the United States, Weitz et al., JAWMA, September 2002
4. Moving from Solid Waste Disposal to Materials Management in the United States, Thorneloe et al., October, 2005
5. Waste Management Greenhouse Gas Emission and Sinks For California -- 2006
6. Landfill Carbon Storage and Greenhouse Gas Inventories, prepared by Randall Freed, Sarah Shapiro, Brad Hurley, ICF International
7. Solid Waste and Recycling GHG Life-Cycle